

YALE UNIVERSITY
OSBORN BOTANICAL LABORATORY
NEW HAVEN, CONNECTICUT

December 21, 1946.

Dear Dr. Mather:

Here are the data which we discussed during your visit:

B biotin; ϕ phenylalanine ; C cystine; T threonine; L leucine; M methionine
P proline; B₁ thiamin; Lac lactose(fermentation) T₁ bacteriophage (resistance).

1. [B ϕ C T P T₁] ---++s X +++--r

++++s	++++r
7	2
44	16
15	5
16	5
25	2
<u>107</u>	<u>30</u>

3.56:1

R: 22%

---++r X +++--s

++++s	++++r
3	27
20	20
3	27
<u>6</u>	<u>76</u>

1:12.6

R: 92%

2. [B ϕ C T L B₁ T₁] ---++s X +++--r

++++s	++++r
25	10
19	10
29	20
60	13
<u>133</u>	<u>53</u>

2.51: 1

R 28%

---++r X +++--s

++++s	++++r
7	19
10	27
6	34
23	80

1: 3.47

R 77%

3. [B M T P T₁]

++s X ++r	++s X ++r
19	5

3.8: 1
R 21%

---++r X +++--s

++s X ++r	++s X ++r
2	18
4	26
2	5
8	49

1: 6.1

R 86%

4. [B M T L B₁][Lac T₁]

++++s

-r	-s	+r	+s
9	3	2	0
31	6	16	4
11	2	5	0
28	21	21	0
21	18	11	0
<u>100</u>	<u>50</u>	<u>55</u>	<u>4</u>

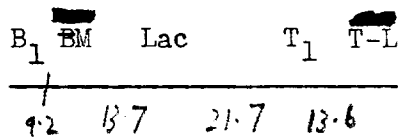
++++s	-r	-s	+r	+s
17	13	9	1	1
13	8	8	0	0

30 21 17 1

Other biochemical types are rare compared to +++++: (less than 10%)

in particular: -++++; +-+++; ++-++ and ++++--

The map:



is suggested by the following considerations:

1. Linkage of T_1 to T-L
2. Linkage of B_1 to M; T to L
3. Linkage of Lac to B-M; of B_1 to B-M but the 'independence' of B_1 with respect to the segregation of Lac and T_1
4. The interference between T_1 and Lac.

Obviously this is rank speculation, inasmuch as we cannot even be sure yet that we have any analogy to linear linkage; I have still been unable to come to any conclusion as to the logical rigor with which linear linkage could be established with this sort of experiment.

Some evidence is beginning to come through for the coincidental appearance of the complementary recombination types, but it is not as yet conclusive.

The segregation of Lac is not modified by the presence of lactose as the sole fermentable carbohydrate. Experiments designed to test for recombination of more than two cell types at a time have been entirely negative; this is perhaps the strongest evidence that we are working with a sexual system, and not transformation via the medium. Types such as -++-+ and -+++-- etc. have been obtained from ---++ X +-+---. Spontaneous mutability of the various factors used has been studied quite closely and can be disregarded in evaluating these ratios.

Your visit was a most stimulating one; My wife joined with me in hoping that you had a pleasant voyage, and in wishing you a Merry Christmas and a fruitful Year.

Very sincerely yours,

Joshua Lederberg
Joshua Lederberg

ACB

0 A0c
1 A6c
1-2. A8c
2 A6C